REMARKS

Claims 38-58 are pending in the present invention. No claims have been added, amended or deleted. Reconsideration of the claims is requested in view of the following remarks.

Claim Rejections Under 35 U.S.C. § 102(b)

Claims 38-43 and 46 stand rejected under 35 U.S.C. § 102(b) as allegedly anticipated by U.S. Patent No. 4,238,299 to Wang (hereinafter "Wang"). Applicants respectively traverse the rejection.

The present claims are directed to a method for producing a coating for absorption of neutrons generated in nuclear reaction of radioactive materials on a shielding element at least partly, the method comprising: providing a shielding element having a base material and appropriately predefined surfaces; providing a dispersion bath comprising a first substance having a high neutron capture cross-section and a second substance being electrolytically precipitable metallic wherein the first substance is in a form of an electrically conductive compound; submerging said shielding element at least partly with appropriately predefined surfaces to be coated into said dispersion bath; intermittently generating a relative movement between the respective surface to be coated and the dispersion bath during the coating process; and removing the shielding element from said dispersion bath.

Wang discloses a method for producing shielding elements containing boron carbide particles embedded in a copper matrix. Wang teaches that a tube of stainless steel is removably situated on the bottom of an electrolytic cell so as to be disposed in electrical contact with a cathode contact connected to a current source. (Column 3, lines 6-12). The cell is filled with "conventional copper electrolyte solution 24 containing copper ions" such that "[t]he entire cell 10 is filled to a level about anode 12...." (Column 3, lines 16-18). Anode 12 is connected to the current source. "[B]oron carbide particles 26 are introduced through funnel 14 *while agitating the electrolyte solution with the stirrers 16.*" (Column 3, lines 20-22, emphasis added). A thin layer of copper is plated on the exposed upper surface of

the tube (before or during the introduction of the boron carbide particles) to improve the bonding between the stainless steel and the layer to be built up on the tube surface. (Column 3, lines 24-27). "*[T]he stirrers 16 are [then] stopped to allow the [boron carbide] particles to settle onto the surface of the tube 18 while electroplating proceeds...,*" thereby trapping the boron carbide particles in the copper plate. (Column 3, lines 29-31, emphasis added). As such, Wang teaches a method of electroplating boron carbide particles onto the tube by stopping agitation to allow the boron carbide particles to settle onto the tube. Thus, there is no dispersion of the boron carbide during the contacting process. Because there is no dispersion of particles, there can be no movement relative to a dispersion bath during the coating process. Further, in this embodiment, there is no movement of the surface to be coated during coating.

In particular, the Examiner alleges that the "Wang discloses applicant's inventive concept" (Paper 17, page 3). The Examiner also alleges that Wang discloses "Providing a dispersion bath having a first substance (26) boron carbide having a high neutron capture cross section and a second substance (24) (copper) being an electrolytically metal" (Paper 17, page 3). Regarding the materials used, the Examiner alleges "While Wang does identify the boron carbide as being electrically non-conductive when combined with the copper ions the boron carbide in question is electrically conductive" (Paper 17, page 3). The Examiner additionally notes that "the boron carbide is added slowly over a period of time while mixing the bath, stopping the stirring allowing the boron carbide particles to settle and then introducing more boron carbide and repeating the process" (Paper 17, Page 3). Applicants respectfully disagree.

Applicants invention differs from the disclosure of Wang in several aspects. First, Applicants invention claims "generating relative movement between the respective surface to be coated and the dispersion bath during the coating process". As admitted by the Examiner, the sections of Wang cited by the Examiner disclose stopping mixing to allow the particles to settle, i.e., stopping mixing during coating. Thus, there is no relative motion during coating in the cited sections of Wang. Second, Wang does not teach the use of a dispersion bath during

the coating process because mixing is stopped and the particles settle during coating. Third, the first substance of the present claims is an electrically conductive compound. Wang specifically states that the Boron carbide particles are "unprecoated electrically nonconductive boron carbide particles". There is no teaching in Wang to suggest that the boron carbide becomes conductive as suggested by the Examiner.

To anticipate a claim under 35 U.S.C. § 102, a single source must contain all of the elements of the claim. *Lewmar Marine Inc. v. Barient, Inc.*, 827 F.2d 744, 747, 3 U.S.P.Q.2d 1766, 1768 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 1007 (1988). Moreover, the single source must disclose all of the claimed elements "arranged as in the claim." *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984).

As stated above, there are three elements missing from Wang: relative movement during coating, a dispersion bath during coating, and a first substance in the form of an electrically conductive compound. Regarding relative movement, the cited sections of Wang do not teach relative movement between the suspended boron carbide particles and the substrate to be coated during the coating process. In fact, mixing is stopped so that the particles may settle by gravity. This is not what is presently claimed. In the present case, relative motion is used during the coating process to keep the particles dispersed in a dispersion bath during the coating process. In the process of Wang, in fact, if mixing were resumed during the coating process, the particles settled by gravity on the surface would be swept away. Thus, mixing during coating is contrary to this teaching of Wang.

With regard to having a dispersion bath during coating, in present application, the first substance (i.e., boron particles) is kept dispersed with the matrix building material (i.e., copper) during the coating process. In Wang, while the boron carbide particles are dispersed in the electrolyte prior to coating, mixing is stopped during the coating process. Thus, in Wang there can be no dispersion bath during coating as the particles are actually setting out of the bath by gravity.

With regard to the first substance in the form of an electrically conductive compound as presently claimed, this element is present in the dispersion bath in the present claims.

There is no teaching in Wang to suggest that the boron carbide particles are coated with the copper in the solution as alleged by the Examiner. In Wang it is stated that "the carbide particles 26 are being dispersed in the electrolyte" and "as the copper level rises, particles 26 become entrapped in the growing composite layer 30" (Col. 3, lines 22-33). Thus, in Wang, there is no teaching that the boron carbide particles become coated with copper before the coating is actually formed. This interpretation is consistent with the nonconductive boron carbide particles settling on the surface to be coated by gravity while the copper is electroplated. Thus, Wang appears to teach only a nonconductive first substance, not conductive as presently claimed.

Because Wang is missing at least three present claim elements, Wang does not anticipate the present claims. Wang also does not render the present claims obvious. Wang provides not motivation or expectation of success to use relative movement between the surface to be coated and a dispersion bath during coating. Because the coating of Wang is done in the absence of mixing and mixing would likely disrupt the coating being formed, Wang appears to teach away from relative movement during coating. Likewise, while Wang teaches a dispersion prior to coating, mixing is stopped so that the boron carbide particles can settle out of the solution during coating. There is thus no dispersion bath during the coating process of Wang. Because the particles settle by gravity, there is no motivation or expectation of success to maintain a dispersion during coating. Finally, Wang teaches a nonconductive boron carbide which can be deposited by gravity while copper is coated electrochemically. There is no motivation or expectation of success for the use of a electrically conductive boron carbide.

For at least the foregoing reasons, reconsideration and withdrawal of the rejections under 35 U.S.C. § 102(b) are requested.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 38-43 and 46 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Wang in view of U.S. Patent No. 5,372,701 to Gerdon ("Gerdon"), U.S. Patent No. 4,865,645 to Planchamp ("Planchamp"), and applicants admitted prior art on Page 7 of the application. Applicants respectfully traverse the rejection.

Gerdon is directed to a process and apparatus for electroplating (Abstract). Gerdon teaches the use of nickel, copper, and cadmium as metals for use in electroplating (Col. 1, lines 42-45).

Planchamp is directed to a nuclear magnetic radiation absorber. Planchamp teaches the use of elements such as gadolinium, samarium, europium, hafnium, cadmium, lithium, dysprosium.

In the Specification on Page 7, Applicants discuss boron materials having augmented neutron capture cross-sections.

In making the rejection, the Examiner states "It would have been obvious to one having ordinary skill in the art at the time the invention was made to have substituted known electroplating materials and high neutron capture cross-section materials, based on the conventional knowledge in the art" (Paper 17, page 5).

As described in detail above, Wang is missing at least three elements of the present claims, i.e., relative movement during coating, a dispersion bath during coating, and a first substance in the form of an electrically conductive compound. Gerdon, Planchamp, and applicants' admitted prior art do not cure these defects.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references; and that the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598

(Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d 1016, 1023 (Fed. Cir. 1996).

None of the cited references alone or in combination disclose relative movement during coating, or a dispersion bath during coating. Thus, there are claim elements that are missing from the cited references. Regarding the disclosure of additional materials in Gerdon, Planchamp, and applicants' admitted prior art, there is no motivation or expectation of success to use these materials in the method of Wang. Wang specifically discloses the use of an electrically nonconductive boron carbide which settles by gravity in the coating while copper is electroplated. There is not motivation or expectation of success for the use of a conductive material in place of the electrically nonconductive material.

For at least the foregoing reasons, reconsideration and withdrawal of the foregoing rejections are requested.

Claims 45 and 47 stand rejected under 35 U.S.C. § 103(a) as allegedly obvious over Wang in view of U.S. Patent No. 3,411,999 to Weinberg ("Weinberg").

Weinberg teaches a method of etching a refractory metal on a surface. It is taught that the electrolyte may be in a glass tank. Ultrasonic vibrations may be used to allow the electrolyte to uniformly attack the surface (Col. 2, lines 26-48).

In making the rejection, the Examiner states "Modification of Wang to have included the vessel construction and mixing teachings of Weinberg would have been obvious to one having ordinary skill in the art at the time the invention was made as such results are in no more than the use of conventionally known equivalents within electroplating art as is evident by the teachings of Weinberg" (Paper 17, page 6).

As described in detail above, Wang is missing at least three elements of the present claims, i.e., relative movement during coating, a dispersion bath during coating, and a first substance in the form of an electrically conductive compound. Weinberg does not cure the defects, thus the disclosure of reaction vessels and mixing methods is not relevant. Wang and Weinberg, alone or in combination, do not render the present claims obvious.

For at least the foregoing reasons, reconsideration and withdrawal of the foregoing rejections are requested.

Based on the arguments set forth above, Applicants respectfully request reconsideration and allowance of the claims.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Cantor Colburn LLP.

Respectfully submitted,

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